# Aquatic Toxicity Due to Residential Use of Pyrethroid Insecticides

D.P. Weston[1], R.W. Holmes[2], J. You[3], and M.J. Lydy[3]

[1]Department of Integrative Biology, University of California, 3060 Valley Life Sciences Building, Berkeley, California 94720-3140, [2]Central Valley Regional Water Quality Control Board, 11020 Sun Center Drive #200, Rancho Cordova, California 95670-6114, and [3]Southern Illinois University, 171 Life Sciences II, Carbondale, Illinois 62901

## Abstract

Pyrethroids are the active ingredients in most insecticides available to consumers for residential use in the United States. Yet despite their dominance in the marketplace, there has been no attempt to analyze for most of these compounds in watercourses draining residential areas. Roseville, California was selected as a typical suburban development, and several creeks that drain the subdivisions of single-family homes were examined. Nearly all creek sediments collected caused toxicity in laboratory exposures to an aquatic species, the amphipod *Hyalella azteca*, and about half the samples caused nearly complete mortality. This same species was also found as a resident in the system, but its presence was limited to areas where residential influence was least. The pyrethroid byfenthrin is implicated as the primary cause of the toxicity, with additional contributions to toxicity from the pyrethroids cyfluthrin and cypermethrin. The dominant sources of these pyrethroids are structural pest control by professional applicators and/or homeowner use of insecticides, particularly lawn care products. The suburbs of Roseville are unlikely to be unique, and similar sediment quality degradation is likely in other suburban areas, particularly in dry regions where landscape irrigation can dominate seasonal flow in some water bodies.

Citation for full paper:

Weston, D.P, R.W. Holmes, J. You, and M.J. Lydy. 2005. Aquatic toxicity due to residential use of pyrethroid insecticides. *Environmental Science & Technology* 39(Dec. 15): 9778-9784.